

# *Progress Report on* **the Injury Control Research Laboratory of the Public Health Service**

**A. F. Schaplowsky, M.S., M.P.H.**

THE Injury Control Research Laboratory in Providence, R.I., performs experimental research on the human factors associated with the cause of injuries. In general, psychological test equipment and driving and other simulation systems are used to analyze behavior under conditions of temporary or chronic impairment and to develop and evaluate remedies for inadequate performance.

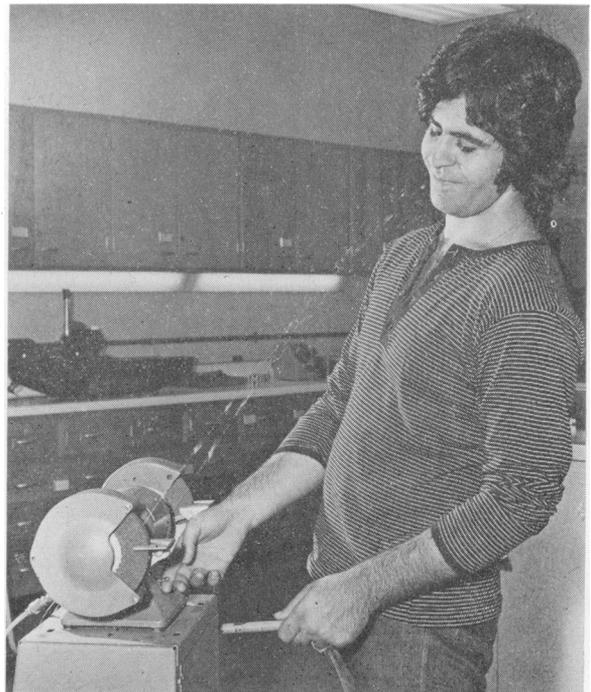
The laboratory is directed by Dr. Robert K. McKelney and operated by the Division of Planning and Standards, Bureau of Community Environmental Management, Environmental Health Service.

## **Studies in Alcohol and Driving**

In 1969, the laboratory completed several studies which revealed that man's sensory and perceptual processes and motor skills are significantly degraded at relatively low levels of blood alcohol. For example, an investigation to determine whether alcohol affects vision more readily than hearing revealed that when blood alcohol levels reached 75 milligrams per 100 milliliters of blood, the test subjects did depend more upon auditory signals than visual signals in making judgments about the speed they were traveling. In addition, other studies showed that the ability to detect moving targets under environmental conditions of low brightness con-

---

*Mr. Schaplowsky is acting director of the Division of Planning and Standards, Bureau of Community Environmental Management, Public Health Service.*



Simulated bench grinder wheel disintegration. Student has started wheel from wrong position without proper guard or safety glasses. During acceleration to operating speed wheel can break down and throw abrasive material into operator's face.

trast is significantly reduced when the blood alcohol level ranges from 50 to 80 mg., and the time it takes to adapt to sudden changes from bright to low levels of light is greatly extended when the blood alcohol level reaches 80 mg.

These findings are important to the prevention of accidents in such situations as drivers detecting other moving objects or pedestrians,

pedestrians detecting moving vehicles, or when a person steps from a brightly lighted room into a dimly lit stairway.

A study of passing behavior revealed that test subjects, driving automobile simulators, were involved in more head-on collisions and side-swiping accidents when their blood alcohol levels reached 90 mg. At these levels also, more errors were made in completing passing maneuvers, such as swinging too far to the left on passing another car and too far to the right when returning to the right lane of the highway after completing a pass.

In a study of driver response to a changing traffic light, it was determined that when the blood alcohol level ranges from 65 to 80 mg. the number of high-risk decisions, such as going through the light on the caution signal, increases significantly. Also, these decrements in

driving judgments were greater when the blood alcohol level was increasing than while it was decreasing.

A 175-pound man must consume about 3 ounces of 100-proof whiskey in 1 hour (slightly more than two drinks) to cause his blood alcohol level to reach 50 mg. About 1½ ounces of 100-proof whiskey is required to raise the blood alcohol level of a 125-pound woman to the same level.

In both risk acceptance studies, however, many of the drivers stated that they felt that their driving behavior in the simulator had actually improved while they were "under the influence."

The findings of the impairments of man's judgment and skill at moderate blood alcohol levels have implications for control measures to counter the increased accident risk when peo-



Testing child for odor preference. In a forced choice odor discrimination, child must indicate which odor he prefers, or likes least.



Simulated punch press accident. Student has placed finger in path of punch which has been modified to mark rather than cut hole in inserted material. Procedures which produce this kind of error can be investigated without harming the operator.

ple drink alcoholic beverages and drive automobiles or perform other tasks which require judgment, skill, and coordination.

In all these studies, the blood alcohol levels were below the legal limits defining intoxication while driving an automobile in most States. The present legal limit in Utah is 80 mg., in 23 States it is 100 mg., and in 24 others it is 150 mg.

The results of another research study indicated that driver control responses in handling an automobile in three types of skids—four-wheel lock, rear-wheel lock, and spin-out—can be taught effectively in a simulator. The impli-

cations for driver training are that simulated training can be substituted for training in an automobile on a skid pan which has increased hazards for the student driver. The more frequent alternative currently is not to attempt to teach these important driving skills.

#### **Other Studies**

A simulated power tool accident (disintegration of a bench grinder wheel) which startles the operator with a heavy, but harmless water spray on his face, was developed by the laboratory and has been shown to be a valuable training device. Its use has demonstrated an

improved and longer lasting benefit when teaching safe operating procedures when compared with the more conventional methods of explaining or describing why certain procedures are important. Training procedures in industry and in vocational education can be improved through the use of this and perhaps other simulated power tool accidents.

Other work directed by the laboratory staff revealed the following:

1. Children, 4-5 years old, do not have odor preferences as do adults. Young children will accept odors which adults avoid, and therefore are not repelled as an adult might expect. Proper storage of common household substances which can be harmful if ingested regardless of their odors is necessary.

2. An inertia reel-mounted, cross-chest shoulder and seat belt harness was preferred over the factory mounted installations in 1968 cars.

3. A paper and pencil attitude test has been devised to aid researchers in screening out persons who might not cooperate well in behavioral research.

4. A review of the literature with implications on signal light design and use in relation to human capabilities has been prepared.

#### Future Studies

The laboratory did not complete any active experimental work on noise during 1969, but plans have been made and equipment assembled for conducting research on a person's ability to perceive and judge the nature and severity of hazards in his environment in the presence of different types of noise. Preliminary work for studies involving drugs has also been completed.

The laboratory is continually contributing to behavioral research methods by developing innovations and techniques for improving behavior research studies. In the laboratory's projects, both environmental settings and personal conditions can be systematically manipulated with little probability of causing physical harm or permanent emotional disturbance to the subject.

#### Tearsheet Requests

Walter Holland, Room 17-86, Parklawn Bldg., 5600 Fishers Lane, Rockville, Md. 20852

## Sexually Transmitted Fungus Disease

Evidence of the sexual transmission of a stubborn and serious pulmonary fungus disease from husband to wife has been uncovered by Ann Arbor, Mich., investigators.

Known as blastomycosis, the yeastlike fungus disease may be fatal if it goes untreated. Usually it develops in the lungs following inhalation of dust which contains *Blastomyces dermatitidis*, the fungus which causes the disease. Blastomycosis may be transported in the blood to other parts of the body—frequently to the genitourinary tract.

Apparently this is what occurred in the case of the 54-year-old husband in the Michigan study. His chest films and complement fixation tests revealed diffuse nodular bilateral pulmonary disease due to *B. dermatitidis*. A detailed report appeared in the July 1970 issue of the *American Review of Respiratory Disease*.

Prostatic and right scrotal indurated swell-

ings suggested secondary hematogenous dissemination of fungi to the genitourinary tract. Microscopic studies of excised granulomatous tissue, following transurethral resection for removal of the inflamed right testicle and epididymis, revealed *B. dermatitidis*. Cultures of epididymectomized tissue produced fungi, and thus confirmed the diagnosis of disseminated blastomycosis.

Concurrently, signs and symptoms of progressive gynecologic disease strongly suggestive of tuberculous salpingitis, peritonitis, and tumor developed in the patient's 64-year-old wife. At hysterectomy, a cancerous tumor and a tubo-ovarian abscess were found. Tissue studies of the excised fallopian tubes and uterus, however, revealed blastomycosis—not tuberculous salpingitis. Both husband and wife responded to treatment.